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ABSTRACT

The present study offers a model of second language learning and examines aspects of the model in two experiments with high school students learning French. The model describes learning in terms of three parameters - learning processes, learning strategies, and learner characteristics. These three parameters together may be used to explain both the general process of second language learning as well as discrepancies in the competence achieved by particular language learners. In the first experiment, the relationship between individual learner characteristics and achievement is examined. Attitude and the use of certain learning strategies prove to be the most important predictors of proficiency. The second experiment investigates more precisely the role of inferencing, one of the learning strategies hypothesized in the model, in language learning. The opportunity to inference was found to improve reading comprehension scores. The results of both experiments are interpreted in terms of the model and suggestions for further research are discussed. (Author)

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ASPECTS OF SECOND LANGUAGE LEARNING IN CLASSROOM SETTINGS[1]

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The process of learning a second language in a formal classroom is dependent upon factors relating to the learner himself, to the classroom environment including the teacher, and to the interaction between the two. The subsequent success or failure of the learner in mastering the language must be contingent upon a combination of these factors. To understand the nature and causes of learning outcomes more precisely, the present study proposes a model of second language learning which identifies some of the factors relevant to language proficiency and examines aspects of the model in two experiments. The results of this investigation will be used to refine the model and to describe those learning factors which are pertinent to success in mastering a second language.

MODEL OF SECOND LANGUAGE LEARNING

The model developed for the present investigation contains three levels of functioning - input, knowledge and output. Language learning may be explained by describing the factors involved at each level and the relationships that exist between levels. The model is presented in Figure 1.

Input refers to various types of exposure to the language and is categorized into two specific varieties. The first is formal instruction and includes classroom learning, textbook explanation, or explicit instruction from any source. The second refers to naturalistic or conversational encounters with the language where meaning, rather than the linguistic form, is the primary objective.

The model identifies three types of information at the knowledge level. Two of these refer directly to the second language and one to other forms of knowledge. The first, Explicit Linguistic Knowledge, refers to the conscious knowledge of some of the rules, vocabulary and other aspects of the language being learned. The second is Implicit Linguistic Knowledge and refers to features of the language which may be mastered but could not be articulated by the learner. Included in this set are some syntactic rules which are employed because a sentence "sounds right," although the rule itself could not be cited. In addition, the model considers Other Knowledge, such as knowledge of the world and knowledge of other languages, which should also affect second language learning.

The distinction between Explicit and Implicit Linguistic Knowledge has recently been clarified by Krashen (1976). According to his theory, a second language is mastered by the processes of both learning and acquisition. The outcome of learning is explicit knowledge of the language, whereas the outcome of acquisition is an unspecified competence, or implicit knowledge.

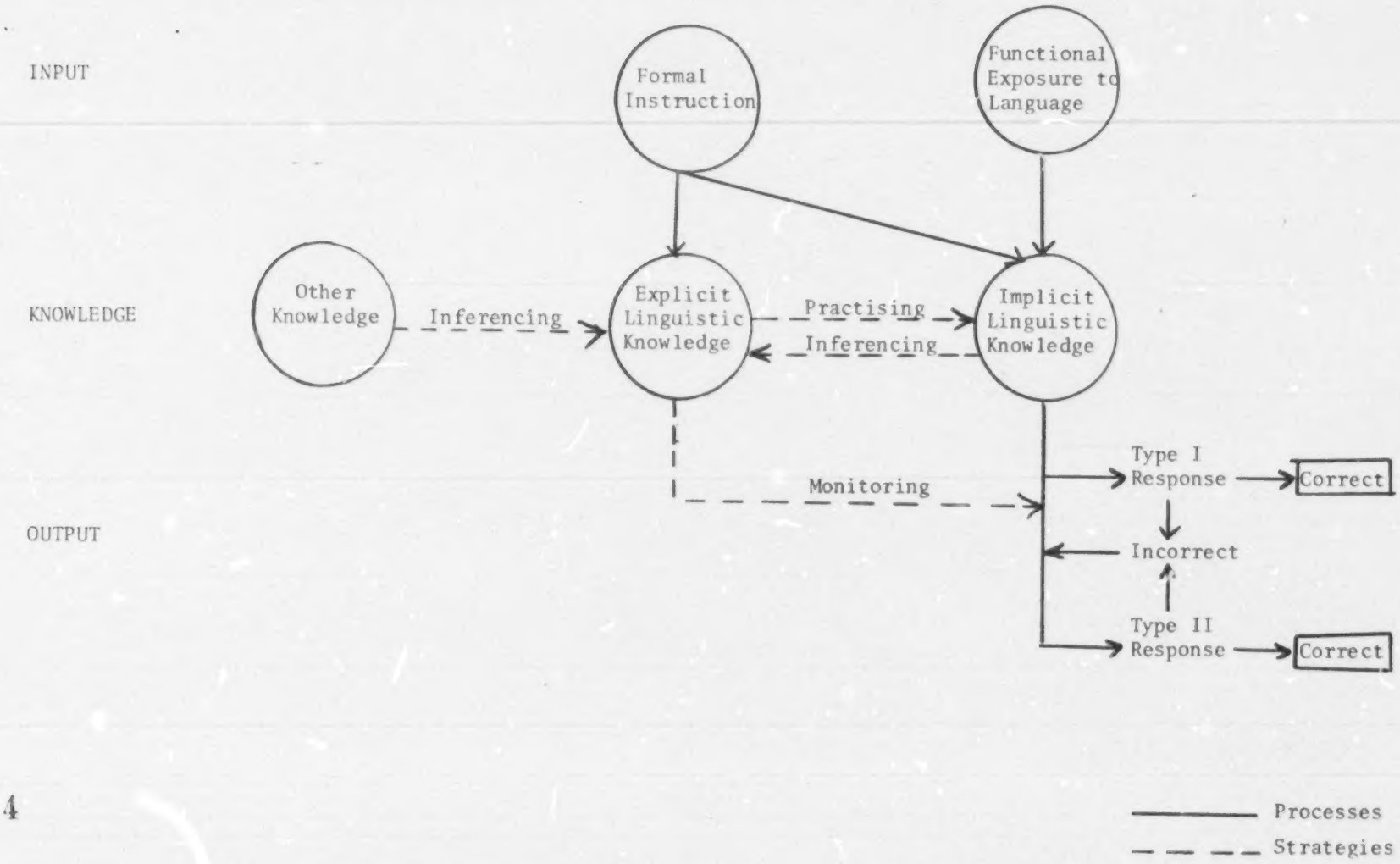

Figure 1. Model of Second Language Learning

Language performance (i.e. communication) generally proceeds by the use of implicit knowledge, that is, conscious rules are not usually referred to for language comprehension and production.

Finally, the third level of the model describes output functions. These are the ways in which the language is used to express or derive meanings. Thus, comprehension and production of the language are represented in the model as output.

The dynamics of the model which are postulated to account for second language learning are described in terms of three aspects -- learning processes, learning strategies, and learner characteristics. It is these aspects that determine the way in which the language is learned and used and the reasons that different levels of proficiency are obtained by different learners in different situations. The investigation of the model is based on an examination of these three aspects.

Learning Processes

Learning processes describe the constraints on language learning which are a consequence of the way in which adults process information in a second language. The processes are unconscious and are based on the three types of information represented in the model.

One of the processes involves the way knowledge is built up in the two linguistic knowledge sources. The model relates the two types of input to knowledge in specified ways. Natural exposure to the language leads into the Implicit Linguistic Knowledge since the goal of the encounter is to derive meaning rather than to extrapolate some particular linguistic rule. Formal instruction, such as classroom learning, however, should provide input into both the Explicit and Implicit Linguistic Knowledge sources. Whereas the rules and exercises routinely practised build up the learner's Explicit Knowledge, the mere exposure to the language experienced in the classroom also improves his Implicit Knowledge of the language.

Learning processes are also involved as the knowledge is utilized at the output level. As it is assumed in the model that language performance is initiated by the Implicit Knowledge, comprehension and production are described by the two lines extending from this source.

Two types of responses are identified in the model. The first, Type I Response, is an immediate, spontaneous response that relies exclusively on implicit knowledge. Examples of these are utterances quickly formed for the sake of fluency, or the immediate comprehension of heard sentences. The second, Type II Response, is a slower, deliberate response that occurs after a delay. The delay allows for some conscious formulation of an utterance or consideration of meaning. It is possible that these Type II Responses are assisted by the use of a monitoring strategy which will be described below.

If a response of either type is incorrect, the speaker has the opportunity to modify or self-correct the utterance or interpretation. An incorrect response feeds back into the main processing line and a new response may be produced. This corrected response is necessarily Type II, since time has now passed from its initiation.

Type I and Type II responses are differentially specialized for different forms of language. Since a Type I response relies on an immediate fluency, it is more appropriate for oral language, such as conversation, where certain rhythms and dynamics are necessary for communication. Written language, however, allows the reader or writer to deliberate on meanings or expressions, and is therefore suitable to Type II Responses.

Thus learning processes are concerned with the elaboration of the knowledge sources and the utilization of these for language comprehension and production.

Learning Strategies

In the present model, learning strategies are defined as the approaches consciously employed by the language learner which have the effect of relating the various knowledge sources to language outcomes. The strategies are used to learn the language system, to express meaning and to derive meaning from language input. All these aspects are important and may be said to comprise the goal of language learning -- the formal systematic features of the language must be mastered and, in addition, the language must be seen as a means of expressing and retrieving meanings. Learning strategies describe the way in which these goals may be achieved more effectively.

Three learning strategies are postulated and discussed for their relationship to language proficiency. The strategies are derived from theoretical discussions in the literature (e.g. Rubin, 1975; Stern, 1975) and from an empirical study (Naiman, et al., 1977). The extent to which each facilitates language learning may be determined by examining the relationships between knowledge sources and outcomes specified by each. The three strategies are practicising, monitoring and inferencing.

Practising is unique among the strategies in that it can occur at all three levels of the model. In addition to the relationship it provides between the sources of knowledge, practising is also invoked each time exposure to the language is arranged or responses are attempted. Thus, practising occurs whenever the learner consciously exercises the processing lines from input to knowledge or from knowledge to output.

The type of practising represented on the model, however, is that which relates the Explicit and Implicit Knowledge. The role of this type of practising is described in terms of automatising the information in the Explicit source so that it can become part of the unconscious Implicit Knowledge. This

transfer of knowledge to the Implicit centre is important in that the model postulates the Implicit centre to be the basis of language comprehension and production. Thus performance improves as implicit knowledge increases. It must be emphasized, however, that while practising may help augment the Implicit Knowledge by importing learned features of the language, the primary source of information to Implicit Knowledge is unconscious acquisition.

The type and amount of practice may relate in a complex way to type of achievement. It could be that practice only of a certain type has any consequences for language proficiency, or that different types of practice are reflected in different types of achievement. Consequently, the concept of practice requires more careful examination.

For the purposes of describing practice more precisely, two parameters may be considered. First, practice may be described in terms of modality used, that is, written or oral language. It is possible that the effects of practice are specific to the activity exercised and have little or no general effects on language proficiency. Thus while practising reading may improve one's reading ability, it may be inconsequential to oral comprehension or production skills. It will be necessary, therefore, to specify the modality in which practice occurs and its effects on specific skills, rather than global improvement in language proficiency.

The second parameter concerns the purpose for practising the language and may be described by Stern's (Stern, et al., 1976) formal/functional distinction. The criterion is whether the language is being exercised for the sake of mastery of its formal properties (grammatical, phonological) or for the purpose of communication. It is possible again that the effects of practice are restricted to its purpose, and formal exercises may not improve communication skills. However, since mastery of both the systematic and communicative properties of language have been considered necessary for language proficiency, it would be important to determine the extent to which practice aids in achieving each of these goals.

In terms of the present model, formal and functional practice relate to the various types of processing. Formal practice would involve exposure to sources of formal instruction, thus increasing Explicit and Implicit Knowledge. Functional practice would require that the learner arrange contact with communicative situations, thereby improving Implicit Knowledge.

The second strategy, monitoring, follows from Krashen's evidence that the critical aspect of language learning is active involvement with the language, rather than mere exposure to it (Krashen, 1976). In his scheme, language learners use their explicit linguistic knowledge as a "monitor" to formulate and modify their linguistic output. Thus good language production requires the use of both the Explicit and Implicit Knowledge sources. The two conditions for the intrusion of the conscious system are sufficient time for the monitor to operate and a conscious attention to form. When these conditions are met and the monitor can operate, language performance improves (Larsen-Freeman, 1975; Krashen, Sferlazza, Feldman and Fathman, in press).

The use of a monitoring strategy is represented in the present model by the line beginning in the Explicit source and modifying the response line. It enters the response line after a certain amount of time has passed, fulfilling the time requirement indicated by the theory. Its entry to response distinguishes the two types of responses which have been described above as Type I Response and Type II Response. While the delay associated with Type II responses makes it possible for the monitor to operate, it does not assure that it will. For example, the condition concerning attention to form must also be present for monitoring to occur. Therefore, while Type II Responses may be monitored, they are not necessarily so.

The implication of the monitor theory is that conscious control of the language is essential for proficiency. Explicit formal knowledge must be utilized in an active way for language performance to improve. In the present model, this is represented by the involvement of the Explicit Linguistic knowledge in monitored responses.

The final learning strategy examined in this model is inferencing. The importance of inferencing in language learning has been discussed at length by Carton (1971), who defines it as the process of "recognizing what is not familiar." His concern is primarily with inferencing strategies as a means of identifying unknown words, and he describes three types of cues that may be used for this purpose. These cues can be called intra-lingual, those given by the structure of the language; inter-lingual, those derived by comparison to the native language; and extra-lingual, those given by the general context or meaning of the message.

While Carton's concern appears to reside at the level of the word meaning, it is possible to extend his arguments to include the derivation of more general meaning. Inferencing may also be an effective strategy for interpreting larger segments of unknown linguistic material and may, in fact, constitute an important means of increasing language proficiency. Carton's three types of cues may be used to deduce general aspects of meaning or structure in a second language. In this case, language learning would proceed not only through explicit instruction, but also through the learner's own guesses and intuitions about the second language. Thus, the use of inferencing as a learning strategy may accelerate language learning.

In terms of the present model, inferencing may be defined as the use of any information in order to derive specific linguistic hypotheses about meaning or form. Thus inferencing may be represented as the exploitation of information in Other Knowledge which is brough into the Explicit Linguistic Knowledge in the form of some insight about the second language as for extra- and inter-lingual inferences, or information in Implicit Linguistic Knowledge, as for intra-lingual inferences. Once it is in this Explicit Knowledge source, that information is then subject to all the processes and strategies applicable to that source, that is, it can be practised and transferred to Implicit Knowledge, or used to monitor a response.

The three strategies together improve language proficiency by allowing the language learner to maximize the use of all available information in order to produce and understand the language. However, the degree to which these strategies should be employed to achieve optimal language proficiency will vary with factors such as the particular learning situation, e.g. conversation, grammar test, reading, etc., and the general proficiency level of the learner, e.g. whether he is at a beginning, intermediate or advanced level. Inappropriate use of these strategies may be detrimental to the learning process. For example, overuse of the monitoring strategy in a communicative situation would result in a disruptive and halting conversation and may eventually lead to a breakdown of communication. In contrast, the under-use of monitoring in a task which clearly demands the production of correct language would lead to unnecessary errors.

Learner Characteristics

While a general model for language learning may be postulated to describe the mechanisms by which language proficiency develops, it is nevertheless the case that some learners will be more successful than others in achieving linguistic competency. These differences in rate and amount of success may be attributed to differences in the individuals, or learner characteristics. The model describes the processes involved in language learning for all learners; individual differences define the efficiency with which the model will operate for a particular individual.

An account of the learner characteristics that may be responsible for differences in achievement is important for instruction. If the pertinent factors are such that they are unmodifiable through instruction, then either instruction will have to be modified to accomodate these learners, or the acquisition of a second language will remain unobtainable to a group of learners. Some examples of such factors may be aptitude or field independence. If, on the other hand, differential achievement can be accounted for by more flexible learner characteristics, such as motivation, then instruction must deal with the encouragement of positive attitudes and strengthen motivation to learn.

A preliminary examination of the relative contribution made by various learner characteristics was undertaken by Naiman, Fröhlich, Stern, and Todesco (in press), in The Good Language Learner. In that study, learners were tested on a number of variables and these scores were related to achievement on tests of receptive and productive competence. Some of the variables examined were field independence, intolerance of ambiguity, extraversion, sensitivity to rejection, as well as a number of attitudinal measures. Their results indicate that the most effective predictor of achievement was general positive attitude. On some tasks field independence proved to be an important variable as well. None of the other personality, attitude, or cognitive style variables accounted for significant portions of the variance.

EXPERIMENT I

The first experiment examined the learner characteristic component of the model by investigating the relationship between some individual differences and language proficiency. Although these are not schematically represented in the model, it is postulated that different levels of achievement may be attributed to variables associated with the learner. These variables affect factors such as the relative benefit derived from input by various learners, the maximal use of varieties of knowledge by means of learning strategies, and the efficiency with which responses are produced for either comprehension or production. These factors together may be described by a particular level of proficiency in the second language. The present experiment was concerned with identifying relevant learner characteristics in terms of their influence on this global proficiency. The four variables selected for examination were (1) attitude and motivation, (2) aptitude, (3) field independence, and (4) use of learning strategies.

Attitude and motivation are two of the most thoroughly examined learner factors in the literature. Early studies by Gardner (1960), and Lambert and others (1963) showed that attitude and motivation frequently played a decisive role in determining successful language learning, regardless of intelligence and language aptitude (Gardner and Lambert, 1972). Other studies have confirmed these findings -- a positive attitude towards language learning and the target language and a high motivation were found to be the best overall predictors of success in learning French as a second language in classroom settings (Naiman, et al., 1977). Thus, an account of learner attitude appeared to be an essential component of any measure of the effects of learner characteristics on language competence.

The second factor to be considered was aptitude. In spite of the reliability with which aptitude has been shown to relate to achievement (Carroll, 1965; Pimsleur, et al., 1966), it was hoped that success in language learning would be less attributable to aptitude than to other factors, such as the use of the learning strategies discussed in the model. These findings would have direct pedagogical implications. It would likely be easier to help language students develop and use learning strategies than to increase their aptitude through training in some of the characteristics of aptitude, as was attempted by Politzer and Weiss (1969).

Field independence is a cognitive style [2] which measures analytic abilities in the perceptual and cognitive domains (Goodenough and Karp, 1961; Witkin, et al., 1971, De Fazio, 1973). In recent studies, field independence was found to correlate highly with achievement in French (Tucker, et al., 1976; Naiman, et al., 1977). Naiman et al.'s results further revealed that field independent learners produced different errors in the target language from field dependent students. To further clarify the relationship between field independence and achievement, this measure was included in the study.

Finally, it was believed that language learners could be differentiated according to the use they made of the three learning strategies. Since some optimal amount of use was postulated to produce the most efficient language learning, differential reliance on these strategies was examined for its role in predicting achievement.

METHOD

Subjects

The study was conducted in one Grade Nine and one Grade Ten class of two different schools.[3] Both schools were situated in middle-class suburban areas of Toronto. Although it would have been preferable to have students of the same grade level, the slight differences in age were considered to be negligible, since the students' length of exposure to French, the more important variable, was about the same. Most students had studied French for approximately four years in a regular school program.

Each class consisted of 26 students, 14 male and 12 female students in the Grade Nine class: 10 males and 16 females in the Grade Ten. In the course of the study, the original total sample of 52 was reduced, since not all the students were present for all the different tests administered. The final analysis of data, therefore, includes only 31 students, of which 14 were male and 17 female.

The two classes differed greatly in ethnic/linguistic background. Of the 14 Grade Nine students (School A) the vast majority (12) spoke English at home, one student came from a bilingual home (English and Arabic), and one student used a language other than English at home. In contrast, of the 17 Grade Ten students (School B), only 8 students came from a monolingual English-speaking home. The remaining students (with the exception of one) came from bilingual homes, in which English plus another language were the means of communication. In most cases, Italian constituted the second language.

Instruments

Attitude and motivation were assessed by Gardner and Smythe's National Test Battery, Form A (1975), which is an abbreviated form of the original test used in Gardner and Lambert's early research studies. This test yields an attitude measure composed of three scores: (1) integrative orientation, (2) motivational intensity and (3) evaluation of the learning situation.

The test for aptitude was the Modern Language Aptitude Test (MLAT) developed by Carroll and Sapon (1959). This test has proven to be a useful predictor of success for learning a language in a formal setting (Carroll, 1965).

Field Independence was assessed by The Hidden Figures Test - V (1962). This test measures the subject's ability to identify a simple figure within a complex design displaying a number of distracting and irrelevant stimuli. Field independent subjects are able to locate the simple figure while field dependent subjects respond to the total configuration and fail to find the simple figure.

A questionnaire[4] was developed by the researchers which attempted to determine how often the individual student employed each of the learning strategies discussed in the model. Practice, for example, was assessed by asking subjects to indicate how often they read each of the following in French: (a) newspapers and magazines, (b) labels on packages, (c) books, or (d) brochures and pamphlets, or how often they listened to sources such as radio and television. Monitoring was measured by the degree to which subjects indicated an active attention to their errors for the purpose of understanding and correcting them. Evidence of this would be in their correction of test results and attention to their oral speech. Finally, inferencing was measured by examining various strategies employed by subjects upon encountering unknown words and passages. Whereas a non-inferencer may consult a dictionary to determine word meaning, an inferencer may first attempt to derive some meaning through the context, similarity with a known word, or some other means. All responses were entered on a four-point scale indicating "often", "sometimes", "rarely", and "never".

The measure of achievement used in the experiment was the students' performance on the International Educational Achievement (I.E.A.) test of reading comprehension, Population II. French grades at school were considered to be inadequate and were not comparable across grades and schools. One of the standardized I.E.A. tests had been successfully used by Naiman et al. (in press) with Grade 10 classes, and was therefore selected as the criterion measure for the present investigation.

Procedures

Before any tests or questionnaires were administered, the two researchers informally observed the classes during a few periods in order to accustom students to their presence. Furthermore, a brief explanation of the purpose of the class visits and subsequent tests was provided. The students were told that the investigators were interested in finding out how French as a second language was learned in school and that they would be given several questionnaires and learning tasks. It was emphasized to the students that their responses to the questionnaires and their test results would be kept confidential and that they would have no effect on their school marks.

The tests and questionnaires were administered in the following order:

1. Attitude and motivation
2. Aptitude
3. Field independence
4. Strategy questionnaire
5. I.E.A. French Reading Test, Population II

The aptitude test was given in two parts because one class period did not allow for sufficient testing time. All instruments were administered during the period from the middle of October to the middle of January, at times convenient to the teachers.

RESULTS

The data were analysed by multiple regression analyses on the criterion measure of reading comprehension. Thus the predictive ability of each factor on reading comprehension was assessed. Variation in the relative effectiveness of some of the factors existed between the two schools, and so the results for the schools will be considered separately.

The total variance accounted for by the combined regression of all the independent variables was 25.6%. An examination of the separate schools, however, shows that in School A the factors predicted 68.1% of the variance in reading comprehension scores, and at School B, 51.1%. The results of the regression analyses are reported in Table 1.

For both schools, integrative orientation and evaluation of the learning situation were two of the three most important factors. Motivational intensity, the third component of the attitude measure, was of very little significance as an independent predictor. Motivation is interesting, however, in that it correlated significantly with many of the other variables. These correlations are reported in Table 2 for the whole sample and in Tables 3 and 4 for School A and School B respectively. When the effects of these correlations are partialled out, motivation accounts for 28.8% of the variance in reading comprehension scores at School A, although it remains about the same at School B where correlational interactions did not occur to the same extent.

Thus, attitude, composed of integrative orientation, motivational intensity, and evaluation of the learning situation, has been shown to be an important predictor of achievement as measured by reading comprehension scores on a standardized test.

The effects of aptitude are widely discrepant between the two schools. Whereas aptitude ranks second as a predictor of achievement at School B, it is the least important predictor at School A and accounts for less than 1% of the variance. The reason for this may again be found in the correlation scores (See Table 3). At School A, aptitude was found to correlate with five of the other factors. When aptitude is considered independently of these factors, it accounts for 16.1% of the variance in comprehension scores at School A, a proportion more comparable to School B's figure of 13.6%.

Table 1. Stepwise Regression: Learner Characteristics on Reading Comprehension for each School.

	School A.		School B.		Whole Sample	
	R. Sq.	R. Sq. Change	R. Sq.	R. Sq. Change	R. Sq.	R. Sq. Change
Strategies Practising	0.014	0.014	0.011	0.011	0.028	0.028
Monitoring	0.237	0.223	0.013	0.002	0.061	0.033
Inferencing	0.287	0.050	0.098	0.085	0.063	0.002
Aptitude	0.289	0.002	0.234	0.136	0.083	0.020
Field Independence	0.312	0.023	0.244	0.010	0.180	0.097
Attitude: Integrative	0.537	0.225	0.369	0.125	0.237	0.057
Motivation	0.551	0.014	0.370	0.001	0.248	0.011
Evaluation	0.681	0.130	0.511	0.141	0.256	0.008

Table 2. Correlations Between Learner Characteristics and Reading Comprehension for Whole Sample

	Practising	Monitoring	Inferencing	Aptitude	Field Indepen.	Integrative Orientation	Motivational Intensity	Evaluation of Learning	Reading Compreh.
Practising	1.00	0.21	-0.15	0.15	0.04	0.26	0.51**	0.42**	0.17
Monitoring	0.21	1.00	0.41**	0.16	-0.10	0.26	0.47**	0.37*	0.21
Inferencing	-0.15	0.41**	1.00	-0.12	-0.01	-0.28	-0.11	-0.30*	0.02
Aptitude	0.15	0.16	-0.12	1.00	0.25	0.20	0.32*	0.15	0.19
Field Ind.	0.04	-0.10	-0.01	0.25	1.00	-0.04	-0.07	-0.04	-0.27
Int. Orien.	0.26	0.26	-0.28	0.20	-0.04	1.00	0.58**	0.69**	0.32**
Mot. Int.	0.50**	0.47**	-0.11	0.32*	-0.07	0.58**	1.00	0.86**	0.35**
Evaluation	0.42**	0.37*	-0.30*	0.15	-0.40	0.69**	0.86**	1.00	0.32**
Reading Com.	0.17	0.21	0.02	0.19	-0.27	0.32*	0.35*	0.32*	1.00

* $p < .05$

** $p < .01$

Table 3. Correlations Between Learner Characteristics and Reading Comprehension for School A

	Practising	Monitoring	Inferencing	Aptitude	Field Indepen.	Integrative Orientation	Motivational Intensity	Evaluation of Learning	Reading Compreh.
Practising	1.00	0.05	-0.16	0.46*	0.23	0.57*	0.67**	0.60*	0.12
Monitoring	0.05	1.00	0.53*	0.55*	0.03	0.17	0.46*	0.27	0.48*
Inferencing	-0.16	0.53*	1.00	-0.23	0.10	-0.36	-0.07	-0.21	0.05
Aptitude	0.46*	0.55*	-0.23	1.00	0.12	0.48*	0.70**	0.51*	0.40
Field Ind.	0.23	0.03	0.10	0.12	1.00	0.26	0.03	0.08	-0.15
Int. Orien.	0.57*	0.19	-0.36	0.48*	0.26	1.00	0.68**	0.81**	0.50*
Mot. Int.	0.67**	0.46*	-0.07	0.70**	0.03	0.68**	1.00	0.91**	0.54*
Evaluation	0.60*	0.27	-0.21	0.51*	0.08	0.81**	0.91**	1.00	0.45
Reading Com.	0.12	0.48*	0.05	0.40	-0.15	0.50*	0.54*	0.45	1.00

* $p < .05$

** $p < .01$

Table 4. Correlations Between Learner Characteristics and Reading Comprehension for School B.

	Practising	Monitoring	Inferencing	Aptitude	Field Indepen.	Integrative Orientation	Motivational Intensity	Evaluation of Learning	Reading Compreh.
Practising	1.00	0.13	0.02	0.14	0.21	-0.18	0.13	-0.21	-0.10
Monitoring	0.13	1.00	0.53*	0.06	-0.02	0.33	0.45*	0.36	-0.05
Inferencing	0.02	0.53*	1.00	-0.11	-0.33	-0.05	0.06	-0.29	0.22
Aptitude	0.14	0.06	-0.11	1.00	0.26	-0.05	0.13	0.05	0.30
Field Ind.	0.21	-0.02	-0.33	0.26	1.00	-0.44*	0.14	0.38	-0.14
Int. Orien.	-0.18	0.33	-0.05	-0.05	-0.44	1.00	0.21	0.43*	0.19
Mot. Int.	0.13	0.45*	0.06	0.13	0.14	0.21	1.00	0.56**	0.02
Evaluation	-0.21	0.36	-0.29	0.05	0.38	0.43*	0.56**	1.00	-0.23
Reading Com.	-0.10	-0.05	0.22	0.30	-0.14	0.19	-0.02	-0.23	1.00

* $p < .05$

** $p < .01$

Field Independence accounted for little of the variance throughout the analyses, nor did it correlate significanctly with any of the other experimental variables. This evidence suggests, therefore, that field independence is not a strong predictor of achievement in a second language, at least for measures of reading comprehension.

Of the strategies examined in the questionnaire, the use of monitoring by subjects at School A proved to be the most important for predicting achievement. For those subjects, 22.3% of the variance of the achievement scores could be explained by the use of monitoring strategies. Inferencing maintained an effect throughout the data, explaining 5.0% of the variance at School A and 8.5% at School B. Although practising, the third strategy, was not found to be an important factor, the results of the learning strategies together suggest that this is a promising area in which to seek explanations for the relative proficiency of various language learners.

In sum, the factors examined by the regression analyses explained half to two-thirds of the variance in reading comprehension scores. The question remains, however, why the set of predictors was less effective at School B than at School A. One possibility is that achievement was also affected by some factor not explicitly or adequately measured in the study.

One of the distinguishing features of the students at School B is that many came from Italian homes and were fluent in Italian. It was possible that this knowledge of another language, particularly one so closely related to French, could well affect French learning and comprehension. In terms of the model used in this study, these students would be using the knowledge of Italian which they have represented in Other Knowledge to inference meanings in the target language. Indeed, students at School B indicated a greater use of inferencing on the strategy questionnaire than did those at School A, but the questionnaire did not explicitly ask about their reliance upon other languages for inferencing.

To examine the hypothesis that inferencing from Italian may have been facilitating achievement, students at School B were divided into two groups - those who spoke Italian and those who did not. The mean score on the achievement test was calculated in each case. The results showed that Italian-speaking students obtained a mean score of 20.9 while non-Italian students scored 12.8. This difference was significant ($t(22)=4.30$, $p<.01$). Thus, regardless of the scores on the predictor factors, achievement on the reading comprehension test was greatly affected by the students' prior knowledge of another language, in this case, Italian.

DISCUSSION

The results of this experiment indicate the extent to which four learner characteristics - aptitude, attitude, field independence, and strategy use, are reflected in second language proficiency as measured by reading comprehension. These learner characteristics, however, may be differentially important for different types of tests. A study by Tucker, et al. (1976) similarly found that attitude was primary in predicting achievement on a reading comprehension test compared to individual factors such as aptitude and cognitive style. Further, the correlation between field independence and achievement reported by Naiman, et al. (1977) but not replicated in this study may be attributed to the particular criterion measure used; Naiman et al. tested listening comprehension and imitation ability, both oral tasks. Further research with this model will investigate these relationships between various factors and specific achievements.

The results suggest that the use of certain learning strategies, particularly monitoring, may be one of the more significant variables contributing to success in second language learning. This is congruent with the results of the adult interview study on language learning strategies, conducted by Naiman, et al. (1977). The pedagogical importance of the finding is that these strategies are potentially teachable. Whereas individual characteristics such as aptitude and field independence are generally resistent to instructional modification, the learning strategies may be less so. In this case, the possibility for improving a learner's language proficiency is greatly increased.

Several questions arise, however, which will have to be answered by future research: (1) What is the relationship between particular strategies and various learning outcomes? (2) What is the extent to which strategies can be taught and learned? The second question has particular relevance for second language teachers and learners.

EXPERIMENT II

The second experiment was designed to examine more precisely one of the learning strategies postulatedin the model. The results of the first experiment suggested that inferencing may have been an important factor in determining achievement in one of the schools. Thus, the role of inferencing in reading comprehension was examined in the present experiment by presenting students with passages in various conditions in which the use of inferencing strategies was differentially facilitated.

Current theories of reading argue that reading proceeds by sampling information in the text to test hypotheses about the meaning (Goodman, 1968; Smith, 1971). Thus, the more information that is available to formulate good hypotheses about meaning, the more efficiently will the reading and understanding proceed. The assumption in these theories and in the present study is that information beyond that provided by the text facilitates comprehension. Thus, the more information is brought to the task, the better reading comprehension will be.

The present study was designed to examine the ways in which some information in Other Knowledge may be used to facilitate comprehension of a reading passage. The information used may be called extra-lingual cues by Carton's criteria, in that it provided a context for the passage. Subjects were presented with passages which were accompanied by various cues and tested for their comprehension of these passages. The extent to which the cues facilitated comprehension may be considered to be a function of the use that was made of that cue to derive the meaning. This use of this additional information to arrive at meaning is called inferencing in the present model.

METHOD

Subjects

The subjects for the study were 44 Grade 10 students from two different schools, the previous School B and another Grade 10 from a different school. All students had studied French for approximately four years in a regular school program.

Materials

Eight French passages, each approximately 150 words in length, were compiled for the study. These represented two different categories - descriptions and stories. An attempt was made to equate all passages for their level of difficulty.

The four descriptions referred to places or buildings in France. The decision to use French, as opposed to Canadian sights, was based on the assumption that these would be less familiar to subjects; that is, they would have less prior knowledge about them at the outset. Therefore, new information provided by the cue would be more likely to have an effect since the information would not already have been available in Other Knowledge.

The four stories were humorous anecdotes. The difference between stories and descriptions is that the former contain a plot which may provide an additional cue facilitating comprehension. The inclusion of both stories and descriptions in the design made it possible to examine this difference.

Each passage was followed by five questions. These were given in English and were to be answered in English as well. The questions tested comprehension of the passage by asking for information concerning the meaning and could not be answered by reiterating sections of the passage.

Four cue conditions were used in the design - no cue, English cue, French cue, picture cue. In the no cue condition, no additional information was provided with the passage. The English cue was a summary statement, approximately 25 words, outlining the gist of the passage but not using any of the words, phrases, or examples from the passage. Thus it provided a context without revealing any specific information. The French cue was a

direct translation of the English sentence. Careful attention was paid to keeping the French simple and comprehensible. Finally, the picture cue presented a diagram which represented approximately the same information as did the sentences.

Design

Each of the four descriptions and stories was used in each of the cue conditons, producing a total of 32 passage-cue pairs. From this total, four different booklets, called Series A, B, C, and D, were compiled, each containing the eight different passages, but accompanied by different cues. Thus, Series A presented Story 1 with no cue, Story 2 with an English cue, Story 3 with a French cue, Story 4 with a picture cue, Description 1 with no cue, and so on. The correspondence between a particular passage and a particular cue was altered in the other three series so that all 32 combinations were represented in the four Series combined. Subjects were randomly assigned to one of the four series.

The booklets were arranged into two sections - each containing two stories and two descriptions. This was done so that testing could be divided into two sessions.

For each passage, the following order of pages was used. A blank page appeared to signal the start of a new passage. The next page contained the cue, if one existed. Following this was the passage on a separate page. Finally, the last page contained the five questions.

Procedures

Subjects were given the booklets and told they would be reading passages in French and answering questions on these in English. The structure of the booklet and the nature of the various cues was explained. The one rule given for testing was that subjects could not turn back pages, although they could spend as long as they wished on each page. This was both to test only the information understood on the first reading and to make the task comparable to one of oral comprehension which was being considered for future research. Thus, questions had to be answered without any reference to the story or cue.

No time limit was set, but subjects finished half the booklet in approximately 30 minutes. The second half was completed under the same conditions several days later.

Scoring

Subjects were given a score out of 5 for each passage. There were 8 scores per subject, one for each cue for each story and description.

RESULTS

The analysis of variance of scores indicated a significant effect of passage ($F(1,40) = 10.03$, $p < .01$). The description passages, with a mean score of 2.92, were found to be easier than were the stories, having a mean score of 2.53.

This difference between passages was further examined by performing a one-way analysis of variance (with repeated measures) on the eight passages, regardless of the cue condition to which each had been assigned. This analysis was significant, ($F(7,301) = 8.91$, $p < .01$) and two types of passages, "easy" and "hard", were identified. There were five hard passages, which had a mean score of 2.45. Of the three "easy" passages, mean score 3.33, two of these were descriptions and one was a story. Thus it may be that the significant passage effect obtained in the main analysis was not a reflection of the general relative simplicity of descriptions as opposed to stories, but of the over-representation of descriptions in the "easy" group.

The analysis of variance also indicated a significant effect of cue ($F(3,120) = 4.03$, $p < .01$). The mean scores were as follows:

no cue	2.52
French	2.55
English	2.83
picture	3.00

A Newman-Keuls analysis showed that the significant difference was between French and English ($p < .05$), that is, English and picture cues produced higher scores than did no cue and French sentences.

There was no interaction of cue by passage.

DISCUSSION

The addition of certain types of extra information to a French reading passage improved comprehension of the passage. Whereas an English statement or a picture facilitated comprehension, a French statement did not assist in the interpretation of the passage.

In terms of the present theory, the English statement and picture increased Other Knowledge which could be brought to the reading task. In these conditions, subjects were given a context in which to interpret the passage; the use of this contextual information to arrive at meaning has been called inferencing. Thus, in these two conditions, it may be concluded that subjects were able to use information supplementary to the passage, and that this inferencing facilitated comprehension.

Two reasons may be suggested for the lack of an effect with a French statement. First, it is possible that the French sentence was not understood well enough by subjects. Although an attempt was made to keep these statements comprehensible by using French that was at least as simple as that used in the passages, there may still have been some difficulty in interpreting these cues.

The second possibility is concerned with the form in which additional information is presented. The French sentence does not provide an opportunity to inference in the same way as do the other cues. Inferencing in this study has been defined as the use of information in Other Knowledge to arrive at the meaning of written French. A sentence in French is not analogous to the other inferencing cues which are either nonlinguistic or in a language other than the target. Neither does it provide an intra-lingual cue in Implicit Knowledge, since the information does not relate to language forms or specific word meanings. The effect of the French sentence may be one of lengthening the passage, that is, providing more information in the same form which requires interpretation, rather than one of adding insight to the comprehension of the passage. In these terms, the lack of effect for French sentences is consistent with the theory - inferencing was not strictly possible for these cues.

In sum, it can be seen that reading comprehension in a second language can be improved when subjects are allowed to exploit a common reading strategy and use additional information to help interpret the passage. Two types of information found to be effective were English summary statements and pictures. The process by which subjects use this information has been called inferencing.

GENERAL DISCUSSION

The preliminary examination of the second language learning model has investigated the role of several learner characteristics and one of three learning strategies, that is, inferencing. The results have shown that learner characteristics can be used to predict level of achievement. Of the four major characteristics examined, integrative orientation and a positive evaluation of the learning situation (two of the three components of the attitude measure) proved to be the best predictors of success for reading comprehension. A group of learning strategies, particularly monitoring, were also found to be promising in terms of their relationship to success. While aptitude was somewhat important, field independence had little effect on proficiency.

The examination of the inferencing strategy demonstrated the hypothesized relation between Other Knowledge and learning outcome, i.e., and increase in Other Knowledge facilitated reading comprehension.

The results of both experiments point to several implications. It was interesting to note that language aptitude correlated with the use of the monitoring strategy. In recent years, it has been argued (Politzer and Weiss, 1969) that the qualities measured by language aptitude tests are in fact strategies that the language learner has to use in order to learn a language successfully. It may be, therefore, that language aptitude and monitoring are both measures of a common ability or describe common strategies.

Other implications of the results are optimistic regarding language pedagogy. It was encouraging to find that those factors which can hopefully be influenced through instruction accounted for most of the variance in achievement, that is, attitude and learning strategies. Aptitude and field independence, which have been shown to be resistent to instructional modification (Politzer and Weiss, 1969; Elliot and McMichael, 1963) were less influential in determining achievement.

Although the findings of this preliminary investigation appear to be promising, many questions still remain unanswered. In order to investigate further the model of second language learning, future research will have to examine the effects of the various factors on other types of achievement, that is, oral comprehension and production tasks. The other learning strategies need further clarification and validation for their hypothesized role in language learning. In addition, it will be of crucial importance to understand how the various knowledge sources are built up, especially the Implicit and Explicit Knowledge. This would involve examination of the learning processes aspects of the model. If the model is to be of value to the practitioner, especially the second language teacher, research will also have to examine the teachability of the various learning strategies and their relative importance in different learning settings.

FOOTNOTES

[1] The research presented in this paper was supported by grants from the Department of the Secretary of State and the Canada Council.

[2] Brown (1973) uses the term cognitive style in reference to "self-consistent and enduring individual differences in cognitive organization and functioning" (p. 238).

[3] In order to gain immediate access to schools and to be able to start this small-scale project without delay, two teachers who were personally known to the research team and had had previous contact with the Modern Language Centre were asked whether they would be interested in participating in this study. Upon their agreement, the principals of the respective schools were asked for permission to conduct this project in their schools. Permission was granted within a few weeks.

[4] The questionnaire used in the present study has been revised and is currently being tested.

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